

EXHIBIT 24

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

ORACLE AMERICA, INC.

Plaintiff,

vs. No. 3:10-cv-03561-WHA

GOOGLE, INC.,

Defendant.

VIDEOTAPED DEPOSITION OF OWEN ASTRACHAN, Ph.D.
San Francisco, California
Monday, March 14, 2016
Volume I

REPORTED BY:

REBECCA L. ROMANO, RPR, CSR No. 12546

JOB NO. 2241710

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1 this matter on this -- this go-around, this most
2 recent go-around?

3 A. Roughly 200 hours.

4 Q. Did anyone assist you in preparing your
5 recent, that is 20- -- 2016, reports in this
6 matter?

7 A. I worked extensively with the counsel in
8 preparing those reports. Other than that, no.

9 Q. And which counsel in particular did you
10 work with?

11 A. I worked with both Matthias and Gene at
12 Kecker & Van Nest. Paige, I think Gene Paige is his
13 last name, but first-name basis is how I talk to
14 these guys in general.

15 Q. And have you reviewed, at any point in
16 connection with comparing -- preparing your 2016
17 report, the opinion of the Federal Circuit Court of
18 Appeals in this matter?

19 A. I did read that opinion, yes.

20 Q. And did you take from it any assumptions
21 about the legal framework governing your work this
22 time around?

23 A. My work in this part of the case is
24 predicated on demonstrating that the use of the
25 software at -- at issue here is a fair use, and

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1 Q. (By Ms. Hurst) What subject matters do
2 you consider yourself to be an expert?

3 MR. KAMBER: Objection to form.

4 THE DEPONENT: I think I have an expert
5 knowledge on many aspects of the software
6 development process, of programming, of programming
7 in specific languages. Of the general -- the
8 courses that I teach, I'm -- I think of myself as
9 reasonably expert in those areas.

10 Q. (By Ms. Hurst) All right. Outside of
11 the computer science and programming area, do you
12 consider yourself to be an expert in any subject
13 matter?

14 A. I wish I was an expert in raising
15 children, but I am not sure I am there.

16 Q. You got a couple of teenagers, right?

17 A. Yes, I do.

18 Q. Putting that aside, all joking aside, are
19 there any other areas in which you consider
20 yourself to be an expert?

21 A. I think that my expertise is mostly based
22 on my professional work to date, which is in this
23 software and computer science setting. So I think
24 that's what comes to mind right now, yes.

25 Q. All right. And would you consider

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1 that's a different situation than in the original
2 case, when it was about whether copyright applied.

3 As I understand it, copyright has been
4 determined to hold in this case, and so we are now
5 looking at whether that use is a fair use.

6 Q. And what assumptions have you applied
7 about the legal framework for evaluating that
8 question of fair use?

9 A. Counsel has explained to me the four
10 prongs of fair use, and I have outlined those in
11 both my opening report and probably the sequence
12 reports, and I have tried to use the framework that
13 counsel has explained to me in analyzing whether
14 this use is, in fact, a fair use.

15 Q. And is there anything -- well, strike
16 that.

17 Did you also use as a legal framework
18 what you saw about fair use in the Federal Circuit
19 opinion?

20 A. Although I --

21 MR. KAMBER: Objection to form.

22 THE DEPONENT: Sorry.

23 I read the Federal Circuit opinion. But
24 in creating my reports, I based my reports on my
25 discussions with counsel on what fair use was.

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1 yourself an expert in economics?

2 A. I do not think of myself as an expert in
3 economics. I think I have a general understanding
4 of economics that's less than my understanding of
5 the computer science.

6 Q. Do you consider yourself an expert in the
7 analysis of product markets?

8 A. I would not consider myself expert in the
9 knowledge of the product markets. Again, I have a
10 pretty good understanding, but my expertise is not
11 there.

12 Q. And would you consider yourself an expert
13 in evaluating consumer demand?

14 A. I am not an expert in the same way I am
15 in my computer science and software field, no.

16 Q. And would you consider yourself an expert
17 in analyzing computer hardware as it relates to the
18 performance of software?

19 A. That's a very general question. I think
20 I have expertise and would consider myself an
21 expert in understanding how software runs on
22 hardware. But if you are asking me low-level
23 questions about a cache in one way that was
24 hardware based, rather than the software that runs
25 on that, that would be something that, off the top

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1 Q. (By Ms. Hurst) Now, in connection with
2 your earlier work in this case, when you offered
3 what a definition of what you considered to be a
4 computer program, did anyone ever give you the
5 language on Exhibit 5158?

6 A. I -- I don't recall.

7 Q. Have you ever seen this definition
8 before?

9 A. I may have.

10 Q. Are you aware that there's a definition
11 of computer program in the Copyright Act?

12 A. That would not be surprising to me, no.

13 Q. Were you aware of it before I just said
14 it?

15 A. I -- since I talk about the Copyright Act
16 in many of the work I do --

17 Q. Okay.

18 A. -- again, I -- it's not -- what -- you
19 know, if you had asked me is it there or not, I
20 think I would not have been able to say
21 definitively it's there, but it's not surprising to
22 me that it is there.

23 Q. All right. So in any work that you have
24 done to date in this case, did you ever use the
25 definition of computer program on Exhibit 5158 to

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1 Q. (By Ms. Hurst) Would it be fair to say
2 that counsel for Google never pointed out this
3 definition for you and asked you explicitly to take
4 it into account?

5 MR. KAMBER: Objection to form.

6 THE DEPONENT: I don't remember such a
7 direction from counsel.

8 Q. (By Ms. Hurst) You mentioned a moment
9 ago that you sometimes -- you are familiar with the
10 U.S. code and you sometimes compare the U.S. code
11 and software code. Is that -- is one of the ways
12 in which you do that when you are giving your
13 presentation of code as metaphor?

14 A. Yes, that's a metaphor that I borrowed
15 from Lawrence Lessig.

16 Q. And what are -- what are the other kinds
17 of code that you talk about when you talk about
18 code as a metaphor?

19 A. I have made presentations where I talk
20 about the code of life in DNA and the code of law,
21 which is the East Coast Code created by legislature
22 in other parts of U.S. government, and in the code
23 of software, which is what Lawrence Lessig refers
24 to as West Coast code.

25 Q. And what do you mean when you say "code"

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1 guide the framework -- to supply a framework or
2 otherwise guide your opinions?

3 MR. KAMBER: Objection to form.

4 THE DEPONENT: In my recollection of the
5 work I have done, I don't recall applying this
6 definition in trying to understand how the Java API
7 works with respect to the copyright issues.

8 Q. (By Ms. Hurst) Would you have liked
9 counsel for Google to give you the statutory
10 definition to inform your analysis?

11 A. I am confident that counsel provided me
12 with access to the U.S. code as part of my work. I
13 would have had access to it anyway, since I do use
14 that in the teaching that I do in -- in telling
15 students where they can find an understanding of
16 our law, that I talk about code of law and code of
17 software and try to understand the differences.

18 So I think that it would be fair to say
19 this was accessible to me.

20 Q. Did you deliberately disregard the
21 Copyright Act definition of computer program in
22 offering your opinions in this case?

23 MR. KAMBER: Objection to form.

24 THE DEPONENT: I did not deliberately
25 disregard the U.S. code, no.

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1 as a metaphor in that context?

2 A. In many of the teaching that I do, I try
3 to relate what students know to what they don't
4 know, and most all of our students understand that
5 there are laws and software and DNA. But by trying
6 to construct some overarching way of looking at it,
7 that has been proven to be an effective way of
8 getting students to appreciate the intellectual
9 enterprise, as it were, of what it is they do. To
10 see that it is not something that works in
11 isolation but is connected to many things.

12 Q. Would it fair to say that you are helping
13 your students ascribe meaning across a wide set of
14 definitions of code?

15 A. I think that's fair, yes.

16 Q. And would it be fair to say that you view
17 software as a form of code which can convey
18 meaning?

19 A. I don't -- I don't view software as
20 conveying meaning to a human in the way that might
21 be taken if I just said, "Would I like to read this
22 book to convey meaning of life?" But software
23 conveys meaning to a computer, and to a programmer
24 it conveys meaning in terms of how the software
25 will run.

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Q. Well, what you are saying is that the APIs provide a shortcut that don't even require them to understand the organization of the implementing code because they are simply able to assume it because by virtue of the existence of the API?

MR. KAMBER: Objection to form.

THE DEPONENT: You used the phrase "organization of the implementing code," and that's one that I'm trying to stay away from. It helps the programmers understand the organization of the classes that they are using. And there's an assumption that when you write your program in the example that we are using here as part of a Java program, that when you run it, the class libraries will allow that program to execute.

I think that most programmers remain blissfully unaware of how that source code is organized in a jar file in a package hierarchy. They write their code according to the API with an assumption that it will work.

Q. (By Ms. Hurst) So is it true that APIs are ways to help understand and use software?

MR. KAMBER: Objection --

THE DEPONENT: I think that's fair.

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the implementing code or things that have been added in the Android platform?

A. I don't think is reflective of the implementing code. The -- when you read the API, you will be aware of what methods exist in the platform you are developing for. But if you are developing an application to run on Android device, you might to be aware of geolocation and WiFi connectivity that would be outside of what the 37 packages provide.

Q. All right. So just sticking to the 37 packages that are common between Java and Android, is it true that to the extent those packages serve the purpose of helping the user understand and use the software on the Java platform and also to that same extent helps the user understand and use the software in the Android platform?

MR. KAMBER: Objection to form.

THE DEPONENT: If by "software," we mean the implementation of the 37 packages, then that -- then that's a fair similarity. But the term "software" for the Java platform and "software" for Android platform could be construed more broadly than simply the AP -- the code that implements the

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MR. KAMBER: Objection to form. Sorry. Q. (By Ms. Hurst) And it is also reasonable to say that how methods and classes are organized is part of understanding software?

A. I think that's also fair to say, yes.

Q. And is it true that to the extent the Java APIs serves the purpose of helping the user understand and use the software in the Java platform, it also, to that same extent, helps the user understand and use the software in the Android platform for -- with respect to the 37 packages at issue?

A. I think that's a complex statement that is basically true in the sense that knowing how the API is structured in Java will be -- will help in writing an Android program where the API is the same. But I want to make it, you know, clear that you need other things -- you need other knowledge to write something for the Android platform that you might not need in the Java platform. So with that small proviso, I think what you are saying is basically correct.

Q. And does that small proviso relate specifically to the 37 -- the declaring code of the 37 packages at issue, or does it relate instead to

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library that is at stake here.

So if we restrict ourselves, as I think was an antecedent to what you said, the API for Java will provide similar functionality understanding the software as it does in Android. Restricted to those 37 packages.

Q. (By Ms. Hurst) Now, have you made any study in connection with your work in this case of whether there are any alterations to the Java API method declarations as contained in the Android platform?

A. I have looked at the similarities and read reports about how some methods in the Android platform are -- have been added and how some are not included from the Java APIs. So to the extent that we are speaking of changes in declaring code, I have looked at that, yes.

Q. All right. So I would like you to set aside additions or omissions and focus instead solely on alterations to what was included, not what was added to what was included and not what was omitted from what was included.

Do you understand that?

A. Yes, I think so.

Q. Focusing specifically and solely on the

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1 A. I think that's correct.

2 Q. Do you ever attend JavaOne?

3 A. I have not attended JavaOne.

4 Q. And did you do any investigation to
5 determine whether the SavaJE phone was the device
6 of the show at the 2006 JavaOne?

7 MR. KAMBER: Objection to form.

8 THE DEPONENT: I did not read the report
9 from that time frame about whether it was a device
10 at the show. I did not see that.

11 Q. (By Ms. Hurst) What is the -- what is
12 the Open Handset Alliance?

13 MR. KAMBER: Objection to form.

14 THE DEPONENT: I have a broad
15 understanding of the Open Handset Alliance as a
16 group of handset manufacturers that work together
17 to come up with standards, to come up with ideas,
18 that will cut across the different manufacturers.

19 Q. (By Ms. Hurst) And did the
20 Open Handset Alliance also include carriers and
21 other parts of the phone ecosystem?

22 A. I not certain. That wouldn't surprise
23 me. But I don't know for a fact if that's the
24 case, but it seems reasonable.

25 Q. And when was the Open Handset Alliance

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1 MR. KAMBER: Objection to form.

2 THE DEPONENT: I don't know the answer to
3 that question.

4 Q. (By Ms. Hurst) And what about the
5 Symbian operating system, are you familiar with
6 that?

7 A. I am familiar with Symbian.

8 Q. And was it based in any way on Java?

9 A. That is not my understanding, no.

10 Q. And are you -- do you have any knowledge
11 one way or the other whether Nokia ever had a
12 license from Sun to use SE in phones?

13 A. No. I don't what licenses Nokia had for
14 Sun. I'm not aware of that at this point.

15 Q. Are you aware of any company having taken
16 a license from Sun to use SE in phones?

17 A. Other than the phone that you have,
18 which, as I understand it from reading
19 Dr. Schmidt's report, had Java SE, and so I made a
20 conclusion that they likely licensed it, I am not
21 aware of others.

22 Q. So are you aware that, you know, many,
23 many license agreements were produced as documents
24 and evidence in this case?

25 A. Yes.

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1 announced?

2 A. I do not know the answer to the question
3 yet.

4 Q. Do you know whether Google led the
5 Open Handset Alliance?

6 A. I don't know the answer to that question
7 either.

8 Q. Do you know whether Google put together
9 the Open Handset Alliance as an initial consortium
10 of companies who were agreeing to use Android?

11 MR. KAMBER: Objection to form.

12 THE DEPONENT: I don't know that.

13 Q. (By Ms. Hurst) Do you know whether
14 Google made a series of presentations to wireless
15 carriers and OEMs, handset manufacturers, about the
16 virtues of its Android platform, in 2006 and 2007,
17 in an effort to get them to adopt that platform.

18 A. No, I don't know that.

19 Q. Let me just stop for a second.

20 Are you familiar with the Palm operating
21 system?

22 A. I have a general understanding of it.
23 I'm aware of its existence, yes.

24 Q. Was it based in any way on the Java
25 platform?

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1 Q. And you are aware many Sun license
2 agreements that were produced as documents in
3 evidence in connection with this case?

4 A. Yes, I am aware of that.

5 Q. In offering your opinions on
6 Factors 1 and 4 of fair use, did you take into
7 account in any way the -- the fact that Sun had
8 licensed phone manufacturers for use of SE in
9 phones?

10 MR. KAMBER: Objection to form.

11 THE DEPONENT: I think the simple answer
12 to that question is, in writing my reports in which
13 I addressed Factors 1 and 4 of fair use, was I
14 aware of licenses, yes. But your question I think
15 is, did I apply that knowledge of the licenses to
16 my analysis of Factors 1 and 4.

17 And to that extent I will say, Well, I
18 was aware of those licenses, and my reports talk
19 about where I stand with respect to
20 Factors 1 and 4.

21 Q. (By Ms. Hurst) Did you make any
22 evaluation of the effect, the economic effect, of
23 Android on Java SE?

24 MR. KAMBER: Objection to form.

25 THE DEPONENT: I discuss in a general way

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1 that the Android has positively affected --
2 affected Java SE, but I did not run any economic
3 models to discuss what that effect might be.

4 Q. (By Ms. Hurst) And, in fact, you are not
5 an economist, right?

6 A. It is correct that I am not an economist.

7 Q. So did you employ any economic principles
8 in evaluating the effect that Android has had on
9 Java SE, if any?

10 MR. KAMBER: Objection to form.

11 THE DEPONENT: I use my general knowledge
12 as a informed person, but I did not apply a set of
13 economic principles from the field of economics
14 other than that of what, you know, an informed
15 citizen in a computer scientist would apply.

16 Q. (By Ms. Hurst) Okay. So just to be very
17 clear, you did not apply any economic expertise in
18 evaluating the effect of Android on Java SE 5?

19 A. I think that's a reasonable statement.

20 Q. And you did not apply any economic
21 expertise in evaluating the effect, if any, of
22 Android on Java ME?

23 A. In general I did not apply economic
24 principals as an economist would, so the answer to
25 that question would be, that's correct.

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1 A. -- in the creation of mine.
2 Q. Your report, your first report was signed
3 as of what date?

4 A. January 8th sounds right, but I hope that
5 I got that right.

6 Q. Yeah. There were no other reports in
7 this phase of the case at that time, were there?

8 A. I -- as I say, I don't think that, in my
9 report, I relied on other reports, but on my
10 general understanding in talking to counsel and in
11 applying my understanding of the software
12 enterprise and industry to what I wrote about
13 there. And I'm reasonably confident that, in my
14 report, I don't try to offer any monetary values or
15 ascribe them to Java SE.

16 Q. You've never really worked in the
17 software industry, have you?

18 MR. KAMBER: Objection to form.

19 THE DEPONENT: If -- if what working in
20 the software industry means, did I create software
21 in a commercial setting, then the answer is no. I
22 did sit for a summer in the Google Chapel Hill
23 office to understand what software developers for
24 Google were doing.

25 Q. (By Ms. Hurst) And what summer was that?

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1 Q. All right. So in offering your opinion
2 on Factor 4, what expertise were you using?

3 A. I used the reports that I was provided by
4 counsel, in terms of understanding what that
5 economic effect might be, and I talked about the
6 effect on Java as a platform, so that when I wrote
7 in my reports that maybe more developers would be
8 brought to Java because they were brought to
9 Android, that was not an economic principle. That
10 was an understanding of the software community and
11 how, if more developers are developing for Android,
12 there are clearly then more developers more capable
13 of developing for Java; thus, Java SE would be
14 something more widely embraced as a simple matter
15 of how many people were capable of developing for
16 it.

17 Q. So when you say you used the reports
18 provided by counsel in terms of understanding the
19 economic effect, what do you mean?

20 A. I did not read the reports that --
21 about -- as I understand it, there are economic --
22 there are reports relating to Factor 4 that I'm, in
23 general, aware of by talking with counsel, but I
24 have not reviewed those reports --

25 Q. Well --

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1 A. 2006/2007 time frame.

2 Q. So you were actually at Google while they
3 were developing Android.

4 A. I wasn't technically working for Google.
5 I was consulting and seeing what might come. And
6 since they had a Chapel Hill office, it was easy
7 for me to go there and see what was happening.

8 Q. In that consultation was when they were
9 developing Android.

10 A. That's the correct time frame, that's
11 correct.

12 Q. Right. So did you meet did you meet with
13 or talk to anyone on the Android team in that
14 period of time?

15 A. I did not. I only spoke to software
16 engineers that were in the Chapel office at Google.

17 Q. Were any of them working on Android?

18 A. I'm not actually knowledgeable of what
19 they worked. I'm reasonably confident it had
20 something to do with mobile. But I was only there
21 because, by being behind a Google firewall, I could
22 talk to folks in California that were in
23 educational enterprise. So I didn't talk to them
24 about the products that they were developing.

25 Q. What do you mean, you were only there to

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1 A. That is correct. 1 of SE in phones, how did that affect your thinking?

2 Q. It was truthful? 2 MR. KAMBER: Objection to form.

3 A. Absolutely. 3

4 Q. Let me go back to the question about 4
5 licenses. 5

6 In evaluating Factor 4 of fair use in 6
7 this case, the effect upon the potential market 7
8 for, or value of the work, did you take into 8
9 account in any way that Sun had granted licenses 9
10 for the use of SE in phones? 10

11 MR. KAMBER: Objection to form. 11

12 THE DEPONENT: I don't think that in the 12
13 writings in my report that I referenced those 13
14 licenses. 14

15 Q. (By Ms. Hurst) So you did not consider 15
16 them; is that true? 16

17 MR. KAMBER: Objection to form. 17

18 THE DEPONENT: As I mentioned, I have 18
19 read about and am generally aware of the licenses 19
20 that are a part of this case, so that knowledge 20
21 would have informed my thinking. But I did not, as 21
22 you say, write about those licenses in my report 22
23 so -- 23

24 Q. (By Ms. Hurst) Well, how did the fact 24
25 that Sun had actually granted licenses for the use 25

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1 right? 1

2 A. Yes, I think that's generally correct. I 2
3 talk about SE versus ME versus EE, and what those 3
4 distinctions are. 4

5 Q. Isn't it true that SE was also widely 5
6 used in embedded devices? 6

7 A. I do talk about that in my report, in 7
8 terms of seeing reasonable use in embedded devices. 8
9 So, yes, I understand that to be the case. 9

10 Q. And -- and embedded devices are often 10
11 devices that have constraints on processing or 11
12 memory capabilities, true? 12

13 MR. KAMBER: Objection to form. 13

14 THE DEPONENT: I think that is the case 14
15 that embedded devices are different than a desktop 15
16 computer, and that they have -- those differences, 16
17 among others, would be the chip memory, et cetera, 17
18 as you just pointed out. 18

19 Q. (By Ms. Hurst) In other words, the 19
20 constraints on embedded devices are somewhat 20
21 similar to the constraints on phones, true? 21

22 MR. KAMBER: Objection to form. 22

23 THE DEPONENT: I think a mobile phone, as 23
24 I understand mobile -- smartphones today, is a much 24
25 different device than an ATM, for example, in terms 25

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1 of SE in phones, how did that affect your thinking? 1

2 MR. KAMBER: Objection to form. 2

3 THE DEPONENT: I'm -- let me just back up 3
4 to make sure that -- I'm under the assumption that 4
5 Java -- that Sun granted licenses, for example, in 5
6 this Jasper phone. But I am not aware of what that 6
7 license agreement is, and have not seen what that 7
8 license agreement is. 8

9 So I am not able to kind of say at this 9
10 juncture what -- what that particular phone running 10
11 Java SE would mean for others looking for a license 11
12 in a similar way. 12

13 Q. (By Ms. Hurst) Well, for example, 13
14 whether it was an exclusive or nonexclusive 14
15 license? 15

16 MR. KAMBER: Objection to form. 16

17 THE DEPONENT: Among many considerations. 17
18 In general, since I haven't seen that license 18
19 agreement, I don't know what it might have said. 19

20 Q. (By Ms. Hurst) And counsel did not give 20
21 you that license agreement? 21

22 A. Not that I'm aware of. 22

23 Q. Now, your opinion regarding the effect of 23
24 Android on Java SE is premised on the idea that the 24
25 purpose of SE was to run on desktops and servers, 25

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1 of what it would need to do. I think the mobility 1
2 and size are much different than in an ATM, than in 2
3 a smartphone. So although they are both different 3
4 than a desktop computer and, thus, they are similar 4
5 in being different, I'm -- I'm -- I would be 5
6 uncomfortable saying that an embedded device like 6
7 an ATM is the same as a smartphone. 7

8 Q. (By Ms. Hurst) Well, I'm not quite 8
9 asking you if an ATM is the same as a smart phone. 9
10 I'm asking you, as a class of devices, it -- 10
11 embedded devices suffer by comparison to desktop 11
12 computers under the same set of constraints that 12
13 phones, as a class of devices compared to desktops, 13
14 suffer from, that is memory and processor 14
15 constraints. 15

16 MR. KAMBER: Objection to form. 16

17 THE DEPONENT: They both -- I would -- 17
18 I -- I agree that they will differ in terms of the 18
19 kinds of chips that are running, that thus speed 19
20 and the amount of memory available to them, but I 20
21 don't want to think that that means that they are 21
22 in the same class of device, but they do differ in 22
23 the same way that you just described to me. 23

24 Q. (By Ms. Hurst) Now, is it your opinion 24
25 in this case that because Java SE was designed with 25

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1 a way that you could add some applications. I
 2 don't know whether those applications leveraged the
 3 ability of Java ME in doing that.

4 Q. (By Ms. Hurst) But the BlackBerry phone
 5 was customizable, wasn't it.

6 A. A BlackBerry phone was capable of having
 7 some changes made, but the customizability of which
 8 I spoke earlier, in terms of adding apps, is far
 9 greater on a smartphone today than it was on a
 10 BlackBerry phone, as you know, just a few years
 11 ago. That's a different level of customization
 12 that we are speaking of here.

13 Q. So you're saying that the great
 14 difference in degree amounts to a difference in
 15 kind.

16 A. I think that's a fair statement.

17 Q. But there wasn't a great difference in
 18 degree when smartphones first started, was there?

19 MR. KAMBER: Objection to form.

20 THE DEPONENT: The first iPhones, the
 21 first Android phones, were very different than the
 22 feature phones that they replaced, both in terms of
 23 their functionality as having touch screens and in
 24 terms of their customizability, although obviously
 25 at the beginning there weren't millions of apps in

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1 smartphones. I have not done such a survey.

2 Q. And when smartphones came on the market,
 3 were they also more expensive than feature phones?

4 A. I think that is, in general, the case,
 5 yes, they were more expensive than -- as a class.
 6 You could always find a feature phone that was
 7 expensive, but smartphones were more expensive.

8 Q. And so at that moment in time back in,
 9 you know, 2007, 2008, when smartphones were
 10 relatively new and there were still many more
 11 feature phones on the market than today, people who
 12 were price sensitive might choose to stay with a
 13 feature phone rather than purchasing a new
 14 smartphone, true?

15 MR. KAMBER: Objection to form.

16 THE DEPONENT: That -- what you've
 17 offered is a reasonable explanation. But as you
 18 also noted before, I have not surveyed consumers to
 19 see why they might stick or not stick. So it's a
 20 layperson's understanding of economics that price
 21 is often a factor in how people choose to make
 22 purchases, so that's a fair statement.

23 Q. (By Ms. Hurst) Now, do you talk about
 24 fragmentation in any of your reports at all?

25 A. I do mention fragmentation, yes.

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1 an App Store, but they were different.

2 Q. (By Ms. Hurst) Were they so different in
 3 degree from the most advanced feature phones,
 4 including Blackberries and other high-end feature
 5 phones --

6 MR. KAMBER: Objection.

7 Q. (By Ms. Hurst) -- that, in your view, it
 8 was a difference in degree or a difference in kind?

9 MR. KAMBER: Objection to form.

10 THE DEPONENT: I think I would say that a
 11 smartphone is a different kind of phone than a
 12 feature phone.

13 Q. (By Ms. Hurst) And have you undertaken
 14 any empirical analysis of any kind in support of
 15 that view?

16 A. I have not done an empirical analysis.

17 Q. Have you, for example, surveyed consumers
 18 regarding the characteristics of -- of various
 19 phones in order to determine whether there was a
 20 distinct category of feature phones versus
 21 smartphones?

22 A. The question that you asked is, have I
 23 surveyed consumers. And the answer is no, I have
 24 not surveyed consumers to find out anything about
 25 what they -- how they view feature phones and

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1 Q. And how -- what are your -- what are your
 2 views on that?

3 MR. KAMBER: Objection to form.

4 THE DEPONENT: Among the things I offer
 5 in my report are that different versions of Java
 6 are essentially inconsistent with each other. I
 7 think I talk about whether Java 5 might fail a TCK
 8 against Java 6. I talk about how Java ME has many
 9 different versions, and how it's not the same as
 10 Java SE. And I -- I also talk about Java EE is a
 11 different platform than either Java SE or Java ME.

12 Q. (By Ms. Hurst) So given all of those
 13 different flavors of Java, doesn't it actually make
 14 sense to you that Sun or Oracle would have been
 15 perfectly willing to agree to create a version of
 16 Java platform that was suitable for smartphones?

17 MR. KAMBER: Objection to form.

18 THE DEPONENT: I -- I -- the logic of the
 19 statement that you made is not one that I'm
 20 comfortable assuming, that because there exist
 21 different versions of Java that run on different
 22 platforms that, therefore, Sun would have been
 23 willing to do something. That -- that leap is a
 24 leap I am not comfortable making.

25 Q. (By Ms. Hurst) Well, it certainly

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there's a chart prepared by Dr. Reinhold that was included in Dr. Schmidt's rebuttal report that sets out a detailed technical analysis of any constraints imposed upon the Java API by the Java programming language?

A. Yes, I have seen that.

Q. And have you made any effort to duplicate or verify or otherwise analyze that chart?

A. No, I have not tried to duplicate. I have looked at the chart.

Q. And, as you sit here today, do you have any opinions on the accuracy of that chart?

A. I think, from a technical perspective, that that chart represents what it says correctly.

Q. And is -- do you have any reason to doubt that that chart is a complete statement of the technical constraints imposed upon the Java API by the programming language?

MR. KAMBER: Objection to form.

THE DEPONENT: I think that there's a spectrum on what those technical constraints would be. I know that the original trial Dr. Reinhold talked about 60-some-odd classes that were going to be required to implement the language and that others have taken a position that, well, there

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the underlying work, what work are you referring to?

A. In this case, I have been asked to write about the 37 APIs from the declaring code perspective. So that's what I understand is at issue here, the declaring code which fits with the structure sequence and organization. And that declaring code, with its associated SSO, is what I wrote about as having been transformed by its use on the Android platform.

Q. All right. Was the java platform transformed by Android's use of the 37 API packages from Java SE and Android?

A. I don't think I've written about whether the java platform was transformed. I think what I wrote about is whether Android represents a transformation in use of the software. And so these particular APIs, declaring code and SSO, were transformed because Android is a different platform in a different hole than Java SE.

So to answer your question, I don't think I wrote about whether Java SE as a whole was transferred. I wrote about the whether the declaring code represented a transformative use of that declaring code.

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actually is more, but that's -- and you have called those technical constraints, and in the chart you can analyze those technical constraints from looking at what's needed to load specific things. But I think the idea that some language -- some packages are more important than others, that's perhaps open to some interpretation on what that spectrum would be. But I take it that the chart that Dr. Reinhold provided that is in Dr. Schmidt's report is an actual reflection of the technical constraints that are analyzed there, which is a long answer.

Q. (By Ms. Hurst) Yeah. And I don't think it's quite the answer to my question, right?

I'm asking you if there -- as you sit here today, can you identify anything specific in the Java API that is constrained by the language that is not expressed in that chart?

A. No, I can't give you any of that information today.

Q. All right. Now, you offered the opinion that the Android platform is transformative of the underlying work, right?

A. That's correct.

Q. And when you say it's transformative of

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Q. All right. And have you offered an opinion about whether the Java SE API in its entirety was transformed by Android's use of the 37 API packages --

MR. KAMBER: Objection.

Q. (By Ms. Hurst) -- in Android?

MR. KAMBER: Objection to form.

Q. (By Ms. Hurst) I might have been redundant there by saying Android twice, but did you understand the question?

A. I think the question is, have I opined on whether Android's use of the 37 declarations in APIs transformed Java SE as a whole? I think that's the question.

Q. Yes.

A. And I don't believe I have written or spoken about that whether that use has transformed Java SE.

Q. What is the standard that you have used in offering your view that Android is a transformation of the 37 packages? What's the definition of transformative that you have used?

A. I have used an understanding of some previous cases that are relevant, from a fair use perspective, that I have used in my courses and

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1 the specific APIs it questioned because of the new
2 way in which it was used. A way that was very
3 different than in the past that allowed different
4 things to be done with the same API than had been
5 done in the past.

6 And so I did not -- I did not apply a
7 specific test, but rather tried to understand this
8 use as very similar to, in which case it wouldn't
9 be transformational, or very different from an
10 "opening new horizons," as it were.

11 And those are words that I'm using now to
12 try to convey the kinds of things that I thought
13 about in indicating that I believe this is
14 transformational.

15 Q. (By Ms. Hurst) All right. In looking at
16 the 37 Java API packages in Android, did Google in
17 any way change the hierarchy of what was copied
18 from those packages and placed into Android?

19 A. Google used --

20 MR. KAMBER: Excuse me. Objection to
21 form.

22 THE DEPONENT: -- the same structure,
23 sequence, and organization. I don't believe that I
24 have talked about a hierarchy in my reports. To
25 the extent that hierarchy reflects that SSO, then

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1 tested"?

2 A. The high level view of that is
3 location.java, as part of the Android platform,
4 would have been in widespread use, and if it didn't
5 operate directly because of that widespread use, it
6 would have been debugged and coders, programmers
7 would have confidence that it would work in a
8 situation because the implementation would, you
9 know, obey the API specifications.

10 Q. Now, you've criticized Dr. Kemerer's use
11 of page rank to evaluate the centrality of the API
12 package, true?

13 A. Yes. I wrote about that in my report.

14 Q. Is the Sora paper the sole basis on which
15 you are criticizing that?

16 A. I also talk about -- and I don't know how
17 to say the author's name, Rememer [sic] -- the
18 paper that he used as the basis for creating part
19 of what he does. That -- that paper talks about
20 weighting different aspects of what's determined as
21 an edge in the network that's -- whose page rank is
22 being calculated, and that creating all edges with
23 the same weight is not what was offered by those
24 offers as the way of doing things.

25 Q. It was not always offered by them, but

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1 Google used the same SSO, and thus hierarchy.

2 Q. (By Ms. Hurst) All right. In -- what is
3 Coursera?

4 A. Coursera is a company that, among other
5 things, partners with universities and also does --
6 on its own creates MOOCs, massively open courses,
7 for learners to learn new material.

8 Q. So if I need to go figure out how to do
9 some Java programming before this trial starts,
10 that would be an example. I could just go on there
11 and take a course?

12 A. You could take the beginning course from
13 me and the more advanced course from Dr. Schmidt,
14 and then I'm sure you'd be well able to make your
15 way through the software community.

16 Q. All right, then. In reviewing one of the
17 pieces that -- that you have given us per your
18 course on there, I notice that you said this: "We
19 used a location.java class from the Android
20 platform. This helped in knowing that the code was
21 robust and well tested."

22 Does that ring a bell, first of all?

23 A. Yes, that rings a bell.

24 Q. Okay. Good.

25 What did you mean by "robust and well

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1 isn't it true that actually making that assumption
2 is more favorable to Google in performing that
3 analysis?

4 MR. KAMBER: Objection to form.

5 THE DEPONENT: I did not run a centrality
6 argument -- analysis with different weights. So I
7 can't tell you today whether running it with some
8 weights versus essentially treating all weights
9 with, you know, a factor of 1, would be beneficial
10 or harmful.

11 Q. (By Ms. Hurst) And the reason that you
12 were concerned about that is that, you know, not
13 all code is the same, right?

14 A. It is certainly true that not all code is
15 the same.

16 Q. All right. So just, for example, when
17 you give programming assignments -- you sometimes
18 give programming assignments to your students,
19 right?

20 A. I do.

21 Q. And do the ones who write the longest
22 code get the best grades, the most lines of code?
23 Is that winning algorithm?

24 A. I would say that the length of a
25 student's submission is not necessarily correlated

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1 with the grade received.
2 Q. It might be inversely proportionate in
3 some cases?

4 A. That could be the case, but it's not
5 always the case.

6 Q. And it's because there is a notion of
7 quality in software, isn't there?

8 A. There's absolutely a notion of quality in
9 software.

10 Q. And some lines of code are better than
11 others, true?

12 A. I think that's fair.

13 Q. And that's true of APIs as well.

14 I'm keeping care of your earlier
15 definition in the case that APIs aren't software,
16 that's kind of off the table now, but I want to
17 make sure you are not excluding APIs from the
18 answers that you just gave.

19 A. I think so. I'm not sure there was a
20 question there.

21 Q. All right. Well, I just want to make
22 sure that it's also true, in your view, that some
23 APIs are better than others, that there is quality
24 in them.

25 A. I think that there is certainly quality

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1 THE DEPONENT: I'm not sure why at that
2 time Google choose not to use OpenJDK. I don't
3 think I wrote about why in my report. So I am not
4 sure what the reasons were.

5 Q. (By Ms. Hurst) All right. And do the
6 reasons -- well, first of all, are you aware that
7 Google, in fact, rejected use of OpenJDK in Android
8 because of the GPLv2 license? Whether you've
9 written about it or not, are you aware that
10 that's -- GPLv2 with classpath exception license
11 was deemed unsuitable for Android?

12 MR. KAMBER: Objection to form.

13 THE DEPONENT: As I mentioned, I don't
14 know why Google choose not to do that. So Google
15 choose not to use that, and, in fact, its license
16 that way, but I don't think I have read about why
17 Google choose not to go that way.

18 Q. (By Ms. Hurst) All right. And you have
19 not considered that reasoning on Google's part in
20 connection with your opinions?

21 A. I think that's right. Since I am not
22 aware of, I can't have considered it.

23 Q. Is it your view that simply because
24 Google could use OpenJDK today, after it sold
25 3.8 billion Android phones, or its business

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1 in APIs, yes.

2 Q. All right. And it is consistent with
3 what you were saying earlier about core libraries.
4 It's also true that the services or functions to
5 which APIs enable access may have greater or lesser
6 degrees of significance in a platform from the
7 perspective of the developer?

8 A. I'm not sure -- is the question that some
9 APIs are more important than others? Is that the
10 question what is?

11 Q. Yeah, why don't we go with that?

12 A. There are certainly APIs that are used
13 more frequently than others. That doesn't
14 necessarily make them more important. Because if
15 you only call it once, but that's the keystone of
16 everything you are doing, then obviously that one
17 has more import. But in -- in any program, there
18 are going to be APIs on which you rely more heavily
19 than others, both in a quantitative and in a
20 qualitative way.

21 Q. Now, are you aware that back in the 2006
22 and 2007 time frame Google, in fact, rejected using
23 OpenJDK because of the GPLv2 with classpath
24 exception license?

25 MR. KAMBER: Objection to form.

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1 partners have sold 3.8 billion phones, that that
2 means it could have adopted OpenJDK in the past?

3 MR. KAMBER: Objection to form.

4 THE DEPONENT: I think the use of OpenJDK
5 today is evidence that Android is using OpenJDK
6 today. That's clear by its very nature. What
7 might have happened in 2006 is not something that I
8 can kind of -- I am not sure forecast is -- is
9 precast. Anyway, I don't know whether that use
10 today necessitates that it could have happened
11 then.

12 Q. (By Ms. Hurst) All right. And by the
13 way, just on the use today, are you aware of that
14 new version of Android having been used in any
15 actual device?

16 A. I don't know the most recent version of
17 Android that is going to use OpenJDK and the next
18 release of Android. I don't know how those are
19 deployed at this point.

20 Q. And are you aware whether Google's had
21 any communications with handset manufacturers about
22 whether open using OpenJDK is going to cause them
23 any problems?

24 A. I'm not aware of any such communications.

25 Q. And are you aware -- can you exclude the

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1 Sun?
2 A. Yes.
3 Q. And you know he also filed an amicus
4 brief in the case?
5 A. I will take that as a given.
6 Q. And expressed the opposite view about the
7 protection of APIs?
8 A. That does not surprise me.
9 Q. You've talked about how, and you ask your
10 students about whether they are downloading music.
11 98 percent of them raise their hands,
12 right?
13 A. I have done that.
14 Q. And you tell them, "Just because you are
15 all doing it, that doesn't make it right." Isn't
16 that true?
17 A. That is true.
18 MS. HURST: Okay. Exhibit 5164 is the
19 opening expert report of Dr. Owen Astrachan on
20 technical issues relating to fair use with the
21 opening report errata.
22 (Exhibit 5164 was marked for identification by
23 the court reporter and is attached hereto.)
24 MS. HURST: Exhibit 5165 is the rebuttal
25 expert report of Dr. Astrachan.

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1 Q. All right. Is your -- your view that
2 Google's use is fair informed in any way by the
3 assumption that there was no harm to Sun or Oracle?
4 MR. KAMBER: Objection to form.
5 THE DEPONENT: I don't think that's part
6 of my analysis. I have talked about the four
7 factors of fair use, and except in the fourth
8 factor, I'm not sure where harm would come into
9 play. But I don't think I have taken a position,
10 nor on whether harm has come, in my analysis.
11 Q. (By Ms. Hurst) So this is not an
12 example, in your view, of no harm, no foul?
13 A. I think, in your question, you're making
14 a reference to the first exhibit that you gave me
15 with a no harm, no foul in my Comp Sci 108 class.
16 And, in that particular case, what I was trying to
17 explain to students is that it's not acceptable to
18 say because you don't think there's harm, that it's
19 necessarily okay. And following up, perhaps
20 unnecessarily, in your statement just moments ago
21 about just because 98 percent of the people have
22 downloaded it.

23 So I think harm -- we're looking at these
24 as legal things and perhaps ethical. So the harm
25 is not part of what you look at in understanding

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1 (Exhibit 5165 was marked for identification by
2 the court reporter and is attached hereto.)
3 MS. HURST: Exhibit 5166 is the reply
4 expert report of Dr. Owen Astrachan.
5 (Exhibit 5166 was marked for identification by
6 the court reporter and is attached hereto.)
7 (Discussion off the stenographic record.)
8 Q. (By Ms. Hurst) Dr. Astrachan, do
9 Exhibits 5164 through 5166 express the entirety of
10 the opinions that you intend to offer in this
11 matter?
12 MR. KAMBER: Objection to form.
13 THE DEPONENT: At this point, I believe I
14 talk in all my reports about if I receive other
15 information, that I reserve the right to use those
16 in what I say. So with that small understanding,
17 this represents what I'm planning on speaking
18 about, yes.
19 Q. (By Ms. Hurst) All right. And there are
20 any opinions that you know today fall within that
21 caveat that you -- you just made? In other words,
22 you know today that you have an additional opinion
23 that -- that you intend to offer that's not already
24 expressed in the report?
25 A. No, today I don't have any such opinions.

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1 whether what you are doing is legal or ethical.
2 MS. HURST: Okay. I think my examination
3 is concluded.
4 MR. KAMBER: No questions for me. Thank
5 you.
6 THE VIDEOGRAPHER: This concludes today's
7 deposition of Dr. Owen Astrachan. Total number of
8 media used is four. We are going off the record at
9 4:00 o'clock p.m.
10 (TIME NOTED: 4:00 p.m.)

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